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EXAMINER	
WANG, JIN CHENG	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/684,401	**Applicant(s)** YONEZAWA ET AL.
	Examiner Jin-Cheng Wang	**Art Unit** 2628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2008*.
2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-24,26-31 and 33-35* is/are pending in the application.
  4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *18-24, 26-31 and 33-35* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
  Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's submission filed on January 16, 2008 has been entered. Claims 1-17, 25 and 32 have been canceled. Claims 18-21, 26-28, 30 and 33 have been amended. Claims 34-35 have been newly added. Claims 18-24, 26-31 and 33-35 are pending in the application.

Response to Arguments

Applicant's arguments filed January 16, 2007 have been fully considered but they are not found persuasive in view of the new ground(s) of rejection set forth in the present Office Action.

Applicant argues in essence with respect to the claim 18 and similar claims that, "even assuming, *arguendo,* Feiner and Filo could have been combined in the manner proposed in the Office Action, it is submitted that such a combination still fails to teach or suggest, among other features, a generation unit that 1) generates a virtual space image to be displayed by the display unit according to a first procedure and 2) generates a virtual space image to be output according to a second procedure which is different from the first procedure, as set forth in Claim 18 of Applicants' invention." The examiner respectfully disagrees with this argument.

Feiner teaches in Page 79 that the HTTP server can call a network object method that selects corresponding graphical items on the head-worn display. Thus data selection works in both directions: from the backpack PC to the handheld PC by launching relevant URLs from the head-worn display's menus and vice versa by selecting buildings, departments, etc on the head-worn display from a link on the handheld's browser. Feiner teaches that the tour application continuously receives input from the GPS position tracker and the orientation tracker and therefore, when the instruction is received from said instruction unit (e.g., such as a printing instruction in a graphical user interface), the mixed reality image is re-generated using a second calculation method-----a second procedure---and sequence such as the blending the graphics image so re-generated with a different building image and different labels are generated to overlay on the building image and thus requiring different calculation methods for calculating the network objects or generating the graphics images to be overlaid on the building images----different procedures/methods for generating the mixed reality space images. Figs. 2-3 show the mixed reality images according to a first viewpoint and a second viewpoint. Based on this input and a database of information about campus buildings, it re-generates the graphics that are overlaid on the real world by the head-worn display. At Page 75 and Section 3, Feiner discloses a browser running on the handheld computer that generates a page of mixed reality on the fly and the web browser allows the page be printed on a printer connected to the handheld computer on a network of base stations on campus wherein the network inherently has a plurality of printers wherein a printing instruction is issued and then the instruction is sent over the network so as to allow a mixed reality space image to be printed in a network printer on the campus-wide network----the determination of the overlay information in the blending for providing a mixed reality space image allows a mixed reality space image to be re-generated differently from the previous one being generated according to a first calculation method/procedure. Thus, the second procedure for generating another mixed-reality space image is clearly different from the first procedure for generating a mixed-reality space image as different calculation methods are employed. Moreover, the printing procedure for printing the virtual space image allows the generation unit to provide a virtual space image different from the one generated by the generation unit according to the different calculation methods because virtual space images are continuously updated and the different calculation methods are employed. See column 2 of Page 78. Since the superposed image is displayed on a web browser, it can be printed on a printer on campus network anywhere and anytime as the virtual space image is continuously being updated. Therefore, Feiner teaches the claim limitation of "a second procedure which is different from the first procedure".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 18-24, 26-31, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steven Feiner, Blair MacIntre, Tobias Hollerer, and Anthony Webster, "Prototyping 3D Mobile Augmented Reality Systems for Exploring the Urban Environment", Personal Technologies, vol. 1, no. 4, pp. 208-217, 1997 (hereinafter Feiner) in view of Filo et al. U.S. Patent No. 6,215,498 (hereinafter Filor).

Re Claims 18-19 and 26-27 and 33-35:

Feiner teaches an image processing apparatus which is connected to print unit adapted to print an image, and can output an image to be printed to the print unit (*See Page 75 at Section 3,* *wherein Feiner discloses a browser running on the handheld computer that generates a page of mixed reality on the fly and the web browser allows the page be printed on a printer connected to the handheld computer on a network of base stations on campus wherein the network inherently has a plurality of printers; see column 2 of Page 78*), comprising:

An image sensing unit adapted to capture an image of a real space (*Page 78, Section 4.1 including a position and orientation tracker with HMD*);

A generation unit adapted to generate an image of a virtual space according to a viewpoint position and orientation of said image sensing unit (*Page 78, Section 4.1 including a position and orientation tracker with HMD and the graphics image of a virtual space is generated in accordance with the position and orientation of the trackers. See Section 4.2, based on the user input and a database of information about campus buildings, it generates the graphics that are overlaid on the real world by the head-worn display. See Section 4.3 wherein the images are generated by the CCD camera. Overlaying virtual objects or graphics and textual texts on the real world images shot by the sensing unit on the head-worn display; see Section 3 wherein the real world image were shot through the head-worn display*);

A composition unit adapted to obtain a mixed reality space image by combining the real space image captured by said image sensing unit and the virtual space image generated by said generation unit (*See Section 4.2, based on the user input and a database of information about campus buildings, it generates the graphics that are overlaid on the real world by the head-worn display. See Section 4.3 wherein the images are generated by the CCD camera. See Section 3; for example, overlaying the textual labels on automatically recognized campus buildings shown in Figures 2 and 3 wherein the building is selected based on the viewpoint of the user's head *position and orientation and the mixed reality image is stored at least in a cache memory or the frame buffer of the head-worn display and displayed on the head-worn display. As shown in Fig. 7, the HTTP server has two components, the campus information server, responsible for the dynamic generation of HTML pages, and a caching proxy server. The purpose of the proxy server is to cache the data returned by external HTTP requests to mitigate the slowness of the radio network link. Commonly accessed pages, such as department home pages and building descriptions, can be pre-cached without relying on the browser's own caching mechanisms*);

A display unit adapted to display a mixed reality space image obtained by said composition unit (*At Page 75 and Section 3, Feiner discloses a browser running on the handheld computer that generates a page of mixed reality on the fly and the web browser allows the page be printed on a printer connected to the handheld computer on a network of base stations on campus wherein the network inherently has a plurality of printers; see column 2 of Page 78; On the web page, the user instructs whether or not the mixed reality space image is to be printed or not and the user interface or the web browser allowing the instruction to be made constitutes the instruction unit allowing the user to instruct whether or not the mixed reality space image is to be printed or not. Since the superposed image is displayed on a web browser, it can be printed on a printer on campus network*);

An output unit adapted to output a mixed reality space image, which is obtained by said composition unit, to the print unit in response to an input of a print instruction (*At Page 75 and Section 3, Feiner discloses a browser running on the handheld computer that generates a page of mixed reality on the fly and the web browser allows the page be printed on a printer connected to the handheld computer on a network of base stations on campus wherein the* *network inherently has a plurality of printers; see column 2 of Page 78; On the web page, the user instructs whether or not the mixed reality space image is to be printed or not and the user interface or the web browser allowing the instruction to be made constitutes the instruction unit allowing the user to instruct whether or not the mixed reality space image is to be printed or not. Since the superposed image is displayed on a web browser, it can be printed on a printer on campus network*); and

Wherein said generation unit generates a virtual space image to be displayed by said display unit according to a first procedure (*e.g., Section 4.2 wherein a system that provides language-level support for distributed virtual environment and CORTERIE is based on the distributed data-object paradigm for distributed shared memory and the tour application running on the backpack PC is response for generating the graphics and presenting it on the head-worn display and the HTTP server can call a network object method that selects corresponding graphical items on the head-worn display and the handheld display controls the head-worn display. The tour application continuously receives input from the GPS position tracker and the orientation tracker and thus continuously updating the mixed reality image composed by the graphics image generated from the handheld computer and the HTTP server and the building image shot from the camera; see Figs. 2-3. It also takes user input from the trackpad that is physically attached to the back of the handheld PC. Based on this input and a database of information about campus buildings, it generates the graphics that are overlaid on the real world by the head-worn display. See also Section 3, when a building is selected, a conical green compass pointer appears at the bottom of the head-worn display, oriented in the building's direction. The pointer turns red if the building is more than 90 degrees away from the* *user's head orientation. This allows the user to find the building more easily if they turn away from it. The pointer is especially useful for finding buildings selected from the hand-held computer. This is made possible by our custom HTTP server, which can tell the backpack computer to select a building on the head-worn display. See Section 4.2, the replicated shared objects support asynchronous data propagation with atomic serializable updates and asynchronous notification of updates*), and said generation unit generates a virtual space image to be outputted by said output unit according to a second procedure which is different from the first procedure (*At Page 75 and Section 3, wherein Feiner discloses a browser running on the handheld computer that generates a page of mixed reality on the fly and the web browser allows the page be printed on a printer connected to the handheld computer on a network of base stations on campus wherein the network inherently has a plurality of printers; clearly the procedure employed in generating the virtual space image to be printed on an output unit is different from the generation procedure for generating another virtual space image as different calculation methods are employed as the virtual space images are continuously updated. See column 2 of Page 78; Since the superposed image is displayed on a web browser, it can be printed on a printer on campus network*).

Feiner teaches in Page 79 that the HTTP server can call a network object method that selects corresponding graphical items on the head-worn display. Thus data selection works in both directions: from the backpack PC to the handheld PC by launching relevant URLs from the head-worn display's menus and vice versa by selecting buildings, departments, etc on the head-worn display from a link on the handheld's browser. Feiner teaches that the tour application continuously receives input from the GPS position tracker and the orientation tracker and therefore, when the instruction is received from said instruction unit (e.g., in a graphical user interface), the mixed reality image is re-generated using a second calculation method-----a second procedure---and sequence such as the blending the graphics image so generated with a different building image and different labels are generated to overlay on the building image and thus requiring different calculation methods for calculating the network objects or generating the graphics images to be overlaid on the building images----different procedures/methods for generating the mixed reality space images. Figs. 2-3 show the mixed reality images according to a first viewpoint and a second viewpoint. Based on this input and a database of information about campus buildings, it generates the graphics that are overlaid on the real world by the head-worn display. At Page 75 and Section 3, Feiner discloses a browser running on the handheld computer that generates a page of mixed reality on the fly and the web browser allows the page be printed on a printer connected to the handheld computer on a network of base stations on campus wherein the network inherently has a plurality of printers wherein a printing instruction is issued and then the instruction is sent over the network so as to allow a mixed reality space image to be printed in a network printer on the campus-wide network----the determination of the overlay information in the blending for providing a mixed reality space image allows a mixed reality space image to be generated differently from the previous one being generated according to a first calculation method/procedure. Thus, the second procedure for generating another mixed-reality space image is clearly different from the first procedure for generating a mixed-reality space image as different calculation methods are employed. Moreover, the printing procedure for printing the virtual space image allows the generation unit to provide a virtual space image different from the one generated by the generation unit according to the different calculation methods because virtual space images are continuously updated and the different calculation methods are employed. See column 2 of Page 78. Since the superposed image is displayed on a web browser, it can be printed on a printer on campus network anywhere and anytime as the virtual space image is continuously being updated. Therefore, Feiner teaches the claim limitation of "a second procedure which is different from the first procedure".

Although Feiner does not explicitly disclose "the print unit", Feiner's apparatus is connected to the campus network and the campus network inherently has a plurality of printers connected to allowing Feiner's web browser to print the mixed reality image upon user's instruction. Nevertheless, Filo discloses the print unit (See Filo column 11, lines 10-26). Filo teaches other claim limitations set forth in the claim 1 and similar claims as well by disclosing the superposition of the virtual objects with the real objects.

It would have been obvious to one of the ordinary skill in the art to have used a printer to print the mixed reality image for review at a later time using the web browser and a network printer (See Feiner Page 78 and Filo column 11, lines 10-26). One of the ordinary skill in the art knows how to connect a printer to a handheld computer. One of the ordinary skill in the art would have been motivated to do so to print the mixed reality image, e.g., in the interest of showing the campus building to a third party (See Feiner Page 78 and Filo column 11, lines 10-26).

With respect to the claims 19, 27, 33 and 35, it needs to be shown whether Feiner teaches the claim limitation of "a determination unit". Feiner teaches in Page 79 that the HTTP server can call a network object method that selects corresponding graphical items on the head-worn display. Thus data selection works in both directions: from the backpack PC to the handheld PC by launching relevant URLs from the head-worn display's menus and vice versa by selecting buildings, departments, etc on the head-worn display from a link on the handheld's browser. Feiner teaches that the tour application continuously receives input from the GPS position tracker and the orientation tracker and therefore, when the instruction is received from said instruction unit (e.g., in a graphical user interface), the mixed reality image is re-generated using a second calculation method and sequence such as the blending the graphics image so generated with a different building image and different labels are generated to overlay on the building image and thus requiring different calculation methods for calculating the network objects or generating the graphics images to be overlaid on the building images. Figs. 2-3 show the mixed reality images according to a first viewpoint and a second viewpoint. Based on this input and a database of information about campus buildings, it generates the graphics that are overlaid on the real world by the head-worn display. Thus, Feiner teaches a determination unit adapted to check a positional relationship among said image sensing unit--*a position and orientation tracker with HMD*, a real space object such as the campus building and a virtual space object such as the different campus building, graphics image and/or labels overlaid with the real space object on the coordinate system and determining whether or not the real space object is overlaid/occluded by the different campus building, graphics image and/or labels in the mixed reality space image.

Claim 20:

Feiner teaches that a pixel size of one side of the virtual space image generated by said generation unit is a value within a product of a length of one side and a resolution of an image that said print unit can output (Feiner Section 4.1).

Re Claims 21 and 28:

Feiner teaches that management unit adapted to manage state information of the real and virtual spaces, and in that said management unit updates the state information of the virtual space in accordance with input information or at each predetermined timing, and said generation unit successively generates virtual space images in accordance with the updated state information of the real and virtual spaces (*e.g., Section 4.2 wherein a system that provides language-level support for distributed virtual environment and CORTERIE is based on the distributed data-object paradigm for distributed shared memory and the tour application running on the backpack PC is response for generating the graphics and presenting it on the head-worn display and the HTTP server can call a network object method that selects corresponding graphical items on the head-worn display and the handheld display controls the head-worn display. The tour application continuously receives input from the GPS position tracker and the orientation tracker. It also takes user input from the trackpad that is physically attached to the back of the handheld PC. Based on this input and a database of information about campus buildings, it generates the graphics that are overlaid on the real world by the head-worn display*).

Re Claims 22 and 29:

Feiner further teaches that said management unit is an independent apparatus connected to said image processing apparatus via a network, and the state information of the virtual space updated by said management unit can be received by image processing apparatuses which are equivalent to said image processing apparatus, and are connected to the network (*e.g., Section 4.2 wherein a system that provides language-level support for distributed virtual environment and CORTERIE is based on the distributed data-object paradigm for distributed shared memory and the tour application running on the backpack PC is response for generating the graphics and presenting it on the head-worn display and the HTTP server can call a network object method that selects corresponding graphical items on the head-worn display and the handheld display controls the head-worn display. The tour application continuously receives input from the GPS position tracker and the orientation tracker. It also takes user input from the trackpad that is physically attached to the back of the handheld PC. Based on this input and a database of information about campus buildings, it generates the graphics that are overlaid on the real world by the head-worn display*).

Re Claims 23 and 30:

Feiner further teaches that said apparatus can be simultaneously used by at least one user, and has said image sensing unit, said generation unit, said composition unit, said display unit, and detection unit adapted to detect a viewpoint position and visual axis direction of a user, which are prepared for each user (*e.g., Section 4.2 wherein a system that provides language-level support for distributed virtual environment and CORTERIE is based on the distributed data-object paradigm for distributed shared memory and the tour application running on the backpack PC is response for generating the graphics and presenting it on the head-worn display and the HTTP server can call a network object method that selects corresponding graphical items on the head-worn display and the handheld display controls the head-worn display. The tour application continuously receives input from the GPS position tracker and the orientation* *tracker. It also takes user input from the trackpad that is physically attached to the back of the handheld PC. Based on this input and a database of information about campus buildings, it generates the graphics that are overlaid on the real world by the head-worn display*).

Re Claims 24 and 31:

Feiner further teaches that said display unit and said image sensing unit, forms or form a head-mounted display device to be mounted on a head of the user (Fig. 1).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (571) 272-7665. The examiner can normally be reached on 8:00 - 6:30 (Mon-Thu).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jin-Cheng Wang/
Primary Examiner, Art Unit 2628